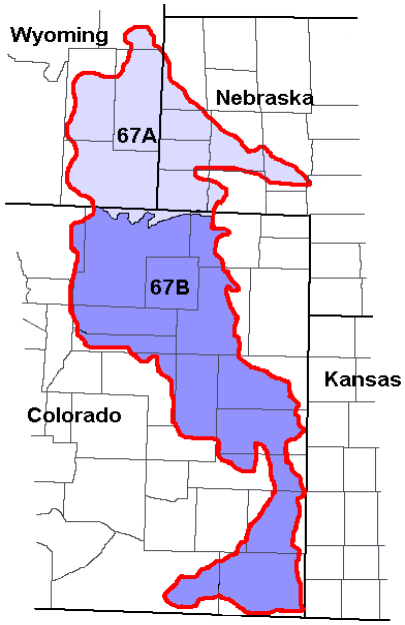
United States Department of Agriculture
Natural Resources Conservation Service

Ecological Site Description



Site Type: Rangeland

Site Name: Choppy Sands

Site ID: R067BY022CO

Major Land Resource Area: 67B – Central High Plains, Southern Part

Physiographic Features

This site occurs on dunes and steep hills. There are many narrow ridges, sharp peaks, catsteps or terracettes, and small blowouts associated with this site.

Landform: dune, hill

Aspect: N/A

	Minimum	Maximum
Elevation (feet):	3800	5250
Slope (percent):	15	40
Water Table Depth (inches):	60	60
Flooding:		
Frequency:	none	none
Duration:	none	none
Ponding:		
Depth (inches):	0	0
Frequency:	none	none
Duration:	none	none
Runoff Class:	negligible	low

Climatic Features

The mean average annual precipitation varies from 12 to 16 inches per year depending on location and ranges from less than 8 inches to over 20 inches per year. Approximately 75 percent of the annual precipitation occurs during the growing season from mid-April to late-September. Snowfall can vary greatly from year to year but averages 35 to 45 inches per year. Winds are estimated to average about 9 miles per hour annually, ranging from 10 miles per hour during the spring to 9 miles per hour during late summer. Daytime winds are generally stronger than nighttime and occasional strong storms may bring periods of high winds with gusts to more than 90 miles per hour.

The average length of the growing season is 142 days, but varies from 129 to 154 days. The average date of first frost in the fall is September 28 and the last frost in the spring is about May 9. July is the hottest month and December and January are the coldest. It is not uncommon for the temperature to exceed 100 degrees F during the summer. Summer humidity is low and evaporation is high. The winters are characterized with frequent northerly winds, producing severe cold with temperatures dropping to -35 degrees F or lower.

Growth of native cool season plants begins about March 15 and continues to about June15. Native warm season plants begin growth about May 15 and continue to about August 15. Regrowth of cool season plants may occur in September and October of most years, depending on moisture.

	Minimum	Maximum
Frost-free period (days):	129	154
Freeze-free period (days):	151	178
Mean Annual Precipitation (inches):	12	16

Average Monthly Precipitation (inches) and Temperature (ºF):

	Precip. Min.	Precip. Max	Temp. Min.	Temp. Max.
January	0.32	0.36	12.0	45.1
February	0.26	0.38	15.9	50.9
March	0.83	0.87	22.3	58.9
April	1.28	1.38	30.1	69.1
May	2.32	2.49	39.9	78.0
June	1.93	2.57	49.0	88.7
July	1.42	2.31	55.0	93.9
August	1.07	2.38	53.5	91.9
September	1.02	1.40	43.8	83.8
October	0.89	1.00	32.5	72.9
November	0.52	0.53	20.9	57.4
December	0.34	0.37	11.9	46.9

Climate Stations		Period	
Station ID	**Location or Name**	**From**	**To**
CO0945	Briggsdale	1948	2000
CO4076	Holly	1918	2000
CO9147	Windsor	1948	1990

For local climate stations that may be more representative, refer to http://www.wcc.nrcs.usda.gov.

Influencing Water Features

Wetland Description:	**System**	**Subsystem**	**Class**	**Sub-class**
None	None	None	None	None

Stream Type: None

Representative Soil Features

The soils of this site are very deep, excessively drained and are rapid or very rapidly permeable. These soils occur on dune and hills. Slopes are dominantly 15 to 40 percent, but some areas are less than 15 percent. The available water capacity is typically very low. The soil surface layer is typically 3 to 10 inches thick and is sand, fine sand, or loamy sand. The pH of these soils range from neutral to slightly alkaline. The soil moisture regime is ustic aridic and the soil temperature regime is mesic.

The Historic Climax Plant Community (HCPC) should show slight to no evidence of rills. Water flow paths, if any, are broken, irregular in appearance or discontinuous. Wind scoured areas are inherent to this site and some soil movement may be noticeable on various landscape positions. Minor plant pedestalling may occur in these areas also. Overall, the soil surface should be stable and intact. Sub-surface soil layers are non-restrictive to water movement and root penetration.

These soils are susceptible to wind erosion where vegetative cover is inadequate.

Major soil series correlated to this ecological site include: Valent

Other soil series that have been correlated to this site include: none

Parent Material Kind: eolian deposits
Parent Material Origin: mixed
Surface Texture: sand, fine sand, loamy sand
Surface Texture Modifier: none

Subsurface Texture Group: sandy
Surface Fragments ≤ 3" (% Cover): 0
Surface Fragments > 3" (%Cover): 0
Subsurface Fragments ≤ 3" (% Volume): 0
Subsurface Fragments > 3" (% Volume): 0

	Minimum	Maximum
Drainage Class:	excessive	excessive
Permeability Class:	rapid	very rapid
Depth (inches):	80	80
Electrical Conductivity (mmhos/cm)*:	0	0
Sodium Absorption Ratio*:	0	0
Soil Reaction (1:1 Water)*:	6.6	7.8
Available Water Capacity (inches)*:	2	3
Calcium Carbonate Equivalent (percent)*:	0	0

*These attributes represent 0-40 inches in depth or to the first restrictive layer.

Plant Communities

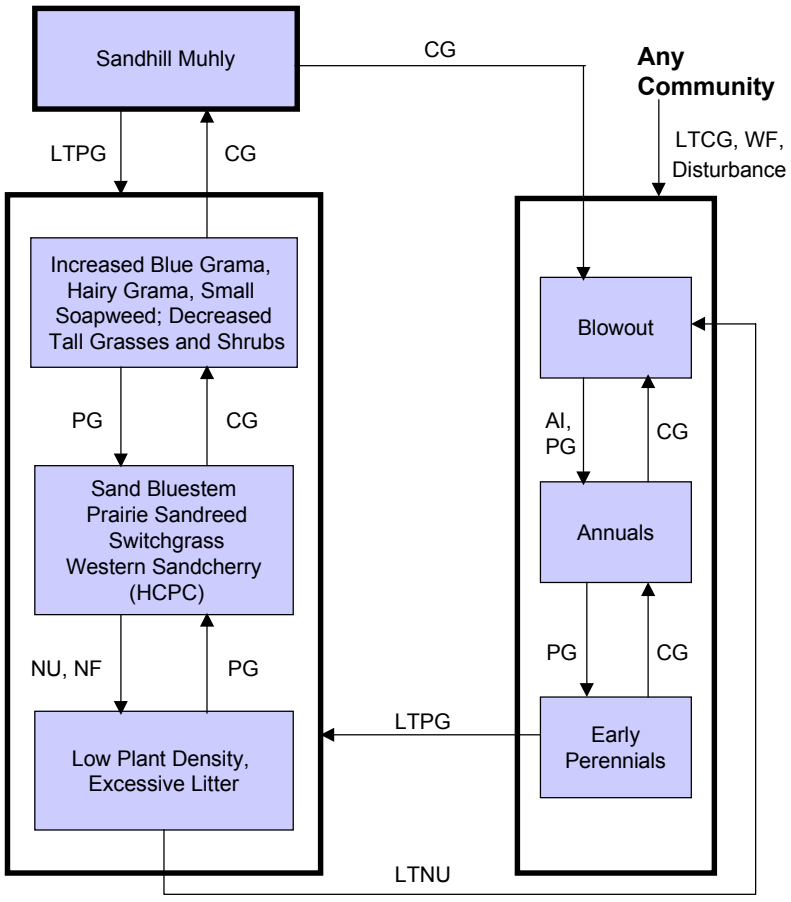
Ecological Dynamics of the Site:

Continuous grazing without adequate recovery opportunities following each grazing event during the growing season will initially cause blue grama, hairy grama and small soapweed to increase. Species such as sand bluestem, prairie sandreed, switchgrass, western sandcherry, leadplant and palatable forbs will decrease in frequency and production. Sandhill muhly will continue to increase under continuous grazing. Non-use, continuous grazing, wildfire, brush management or any type of physical disturbance can lead to serious erosion problems (blowouts, wind scoured areas) on these fragile soils.

The historic climax plant community (description follows the plant community diagram) has been determined by study of rangeland relic areas, areas protected from excessive disturbance, seasonal use pastures, short durationl/time controlled grazing and historical accounts.

The following diagram illustrates the common plant communities that can occur on the site and the transition pathways (arrows) among communities. Bold lines surrounding each plant community or communities represent ecological thresholds. The ecological processes are discussed in more detail in the plant community descriptions following the diagram.

Plant Communities and Transitional Pathways



AI - animal impact, **CG** - continuous grazing without adequate recovery period, **HCPC -** Historic Climax Plant Community, **LTCG** - long term continuous grazing (>25 yrs), **LTNU** - long term non-use (>25 yrs), **LTPG** - long term prescribed grazing (>20 yrs), **NF** - no fire, **NU** - non-use, **PG** - prescribed grazing with adequate recovery period, **WF**- wildfire

Plant Community Composition and Group Annual Production

			Sand Bluestem, Prairie Sandreed, Switchgrass, Western Sandcherry (HCPC)		
COMMON/GROUP NAME	**SCIENTIFIC NAME**	**SYMBOL**	**Group**	**lbs./acre**	**% Comp**
GRASSES & GRASS-LIKES			*1*	*1200 - 1440*	*75 - 90*
prairie sandreed	Calamovilfa longifolia	CALO	1	320 - 400	20 - 25
sand bluestem	Andropogon hallii	ANHA	1	320 - 400	20 - 25
switchgrass	Panicum virgatum	PAVI2	1	80 - 240	5 - 15
Indiangrass	Sorghastrum nutans	SONU2	1	80 - 160	5 - 10
needleandthread	Hesperostipa comata ssp. comata	HECOC8	1	80 - 160	5 - 10
little bluestem	Schizachyrium scoparium	SCSC	1	80 - 112	5 - 7
blue grama	Bouteloua gracilis	BOGR2	1	16 - 80	1 - 5
sand dropseed	Sporobolus cryptandrus	SPCR	1	16 - 48	1 - 3
tall dropseed	Sporobolus compositus var. compositus	SPCOC2	1	0 - 80	0 - 5
blowout grass	Redfieldia flexuosa	REFL	1	16 - 32	1 - 2
hairy grama	Bouteloua hirsuta	BOHI2	1	16 - 32	1 - 2
Indian ricegrass	Achnatherum hymenoides	ACHY	1	16 - 32	1 - 2
sandhill muhly	Muhlenbergia pungens	MUPU2	1	16 - 32	1 - 2
sand paspalum	Paspalum setaceum	PASE5	1	16 - 32	1 - 2
prairie junegrass	Koeleria macrantha	KOMA	1	0 - 32	0 - 2
sideoats grama	Bouteloua curtipendula	BOCU	1	0 - 32	0 - 2
red threeawn	Aristida purpurea var. longiseta	ARPUL	1	0 - 16	0 - 1
sun sedge	Carex inops ssp. heliophila	CAINH2	1	16 - 32	1 - 2
needleleaf sedge	Carex duriuscula	CADU6	1	0 - 16	0 - 1
thinstem flatsedge	Cyperus lupulinus	CYLU2	1	0 - 16	0 - 1
other native grasses		2GP	1	16 - 80	1 - 5
FORBS			*2*	*80 - 240*	*5 - 15*
pacific peavine	Lathyrus polymorphus	LAPO2	2	16 - 48	1 - 3
lemon scurfpea	Psoralidium lanceolatum	PSLA3	2	16 - 32	1 - 2
narrowleaf penstemon	Penstemon angustifolius	PEAN4	2	16 - 32	1 - 2
purple prairie clover	Dalea purpurea var. purpurea	DAPUP	2	16 - 32	1 - 2
annual buckwheat	Eriogonum annuum	ERAN4	2	0 - 16	0 - 1
bigtop dalea	Dalea enneandra	DAEN	2	0 - 16	0 - 1
bush morning-glory	Ipomoea leptophylla	IPLE	2	0 - 16	0 - 1
Carolina gromwell	Lithospermum caroliniense	LICA13	2	0 - 16	0 - 1
dotted gayfeather	Liatris punctata	LIPU	2	0 - 16	0 - 1
groundplum milkvetch	Astragalus crassicarpus	ASCR2	2	0 - 16	0 - 1
hairy goldaster	Heterotheca villosa	HEVI4	2	0 - 16	0 - 1
heliotrope	Heliotropium convolvulaceum	HECO5	2	0 - 16	0 - 1
ironplant goldenweed	Machaeranthera pinnatifida ssp. pinnatifida	MAPIP4	2	0 - 16	0 - 1
Missouri goldenrod	Solidago missouriensis	SOMI2	2	0 - 16	0 - 1
nuttails evolvulus	Evolvulus nuttallianus	EVNU	2	0 - 16	0 - 1
prairie spiderwort	Tradescantia occidentalis	TROC	2	0 - 16	0 - 1
silky prairie clover	Dalea villosa	DAVI	2	0 - 16	0 - 1
snowball sand verbena	Abronia fragrans	ABFR2	2	0 - 16	0 - 1
stickleaf mentzelia	Mentzelia decapetala	MEDE2	2	0 - 16	0 - 1
stiff sunflower	Helianthus pauciflorus ssp. pauciflorus	HEPAP2	2	0 - 16	0 - 1
upright prairie coneflower	Ratibida columnifera	RACO3	2	0 - 16	0 - 1
veiny dock	Rumex venosus	RUVE2	2	0 - 16	0 - 1
western ragweed	Ambrosia psilostachya	AMPS	2	0 - 16	0 - 1
whiteflower gilea	Ipomopsis longiflora ssp. longiflora	IPLOL	2	0 - 16	0 - 1
woolly Indianwheat	Plantago patagonica	PLPA2	2	0 - 16	0 - 1
wormwood	Artemisia dracunculus	ARDR4	2	0 - 16	0 - 1
other native forbs		2FP	2	16 - 80	1 - 5
SHRUBS			*3*	*80 - 240*	*5 - 15*
western sandcherry	Prunus pumila var. besseyi	PRPUB	3	80 - 160	5 - 10
leadplant	Amorpha canescens	AMCA6	3	16 - 80	1 - 5
small soapweed	Yucca glauca	YUGL	3	16 - 32	1 - 2
Arkansas rose	Rosa arkansana	ROAR3	3	0 - 32	0 - 2
brittle pricklypear	Opuntia fragilis	OPFR	3	0 - 16	0 - 1
plains pricklypear	Opuntia polyacantha	OPPO	3	0 - 16	0 - 1
purple pincushion	Escobaria vivipara var. vivipara	ESVIV	3	0 - 16	0 - 1
sand sagebrush	Artemisia filifolia	ARFI2	3	0 - 16	0 - 1
skunkbrush sumac	Rhus trilobata	RHTR	3	0 - 16	0 - 1
spreading buckwheat	Eriogonum effusum	EREF	3	0 - 16	0 - 1
other native shrubs		2SHRUB	3	16 - 48	1 - 3

Annual Production lbs./acre	LOW	RV*	HIGH
GRASSES & GRASS-LIKES	600 -	1270	- 1510
FORBS	75 -	165	- 245
SHRUBS	75 -	165	- 245
TREES			
TOTAL	750 -	1600	- 2000

This list of plants and their relative proportions are based on near normal years. Fluctuations in species composition and relative production may change from year to year dependent upon precipitation or other climatic factors. *RV - Representative Value.

Plant Community Narratives

Following are the narratives for each of the described plant communities. These plant communities may not represent every possibility, but they probably are the most prevalent and repeatable plant communities. The plant composition table shown above has been developed from the best available knowledge at the time of this revision. As more data is collected, some of these plant communities may be revised or removed, and new ones may be added. None of these plant communities should necessarily be thought of as "Desired Plant Communities". According to the USDA NRCS National Range and Pasture Handbook, Desired Plant Communities will be determined by the decision makers and will meet minimum quality criteria established by the NRCS. The main purpose for including any description of a plant community here is to capture the current knowledge and experience at the time of this revision.

Sand Bluestem, Prairie Sandreed, Switchgrass, Western Sandcherry Plant Community

This is the interpretive plant community and is considered to be the Historic Climax Plant Community (HCPC). This plant community evolved with grazing by large herbivores, is well suited for grazing by domestic livestock and can be found on areas that are properly managed with grazing that allows adequate recovery periods following each grazing occurrence during the growing season.

The plant community consists chiefly of tall warm season grasses. Principle dominants are sand bluestem, prairie sandreed, switchgrass and yellow Indiangrass. Sub-dominant grasses include needleandthread, blue grama and little bluestem. Forbs and shrubs such as pacific peavine, evening primrose, prairie clovers, leadplant and sandcherry are significant. The potential vegetation is about 75-90% grasses and grass-like plants, 5-15% forbs and 5-15% woody plants.

Prescribed grazing that allows for adequate recovery periods after each grazing event and proper stocking will maintain this plant community. Continual or repeated spring grazing and summer deferment will reduce the cool season component of this plant community and increase the warm season component. Spring deferment and continual summer grazing will increase the cool season component and decrease the warm season component of this plant community.

This community is resistant to many disturbances except continuous grazing, plowing and development into urban or other uses. Plant litter is properly distributed with very little movement off-site and natural plant mortality is very low. Nutrient cycle, water cycle, energy flow and community dynamics are all functioning and intact. Extensive and diverse rooting systems are present. Carbon sequestration above and below ground is excellent. If continually grazed and/or over stocked to the point of leaving little stubble or litter, wind erosion will become a major concern.

Production in this community can vary from 750 to 2000 pounds of air dry vegetation per acre per year depending on the weather and will average 1600 pounds.

The following is an estimated growth curve of this plant community expected during a normal year. Vegetative growth begins earlier in the southern reaches (Baca, Bent, Kiowa, Las Animas and Prowers counties) of MLRA-67B. Vegetative growth will typically be suppressed during the months of June through August in these counties due to higher evapotranspiration rates.

Growth curve number: CO6709
Growth curve name: Warm season dominant, cool season sub-dominant; MLRA-67B; upland coarse textured soils.

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	2	7	25	35	15	10	5	1	0	0

(monthly percentages of total annual growth)

Transitions or pathways leading to other plant communities are as follows:

- Continuous grazing without adequate recovery periods will move this plant community toward the *Increased Blue Grama, Hairy Grama, Small Soapweed; Decreased Tall Grasses and Shrubs Plant Community.* Reduced production and erosion are a concern.
- Non-use and lack of fire will shift this plant community to the *Low Plant Density, Excessive Litter Plant Community.*
- Prescribed grazing that allows for adequate recovery opportunity following each grazing event and proper stocking will maintain the *Sand Bluestem, Prairie Sandreed, Switchgrass, Western Sandcherry Plant Community (HCPC).*

Increased Blue Grama, Hairy Grama, Small Soapweed; Decreased Tall Grasses and Shrubs Plant Community

This plant community evolves with continuous grazing resulting from lack of adequate recovery periods during the growing season or throughout the year. Sand bluestem, yellow Indiangrass, switchgrass, prairie sandreed, purple prairieclover, western sandcherry and leadplant have decreased but are still present in small amounts. Blue grama, hairy grama and small soapweed have increased and dominate the community. Sand dropseed, red threeawn, slimflower scurfpea, hairy goldaster, croton, western ragweed, stickleaf, milkvetch and sandhill muhly have also increased.

This plant community is relatively stable but at risk of losing key tall grass species, palatable forbs, western sandcherry and leadplant. Water and nutrient cycles, and energy flow have been impaired due to reduced production, shift in root structure and species composition. Less litter is being produced. Small blowouts or wind scoured areas can be forming at this stage. This is an early stage of desertification.

Production can vary from 400 to 900 pounds of air dry vegetation per acre per year and will average 700 pounds.

The following is an estimated growth curve of this plant community expected during a normal year. Vegetative growth begins earlier in the southern reaches (Baca, Bent, Kiowa, Las Animas and Prowers counties) of MLRA-67B. Vegetative growth will typically be suppressed during the months of June through August in these counties due to higher evapotranspiration rates.

Growth curve number: CO6710
Growth curve name: Warm season dominant; MLRA-67B; upland coarse textured soils.

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	0	5	20	40	20	10	5	0	0	0

(monthly percentages of total annual growth)

Transitions or pathways leading to other plant communities are as follows:

- Continuous grazing without adequate recovery periods between grazing events will shift this plant community across an ecological threshold to the *Sandhill Muhly Plant Community.* Decreased production and increased erosion are concerns.
- Prescribed grazing that allows for adequate recovery periods following each grazing event will move this plant community to the *Sand Bluestem, Prairie Sandreed, Switchgrass, Western Sandcherry Plant Community (HCPC).*

Low Plant Density, Excessive Litter Plant Community

This plant community occurs when grazing is removed for long periods of time in the absence of fire. Plant composition is similar to the HCPC, however, in time, individual species production and frequency will be lower. Much of the nutrients are tied up in excessive litter. The semiarid environment and the absence of animal traffic to break down litter slows nutrient cycling. Aboveground litter also limits sunlight from reaching plant crowns. Many plants, especially bunchgrasses die off. Thick litter and absence of grazing or fire reduce seed germination and establishment. This plant community will change rapidly with prescribed grazing which allows animal impact and adequate recovery periods between grazing events.

Advanced stages of non-use or rest, will place this community at risk of losing many important native species. Long term non-use/rest (greater than 25 years), will cause plant decadence and mortality to increase and erosion (blowouts, wind scoured areas) may eventually occur if bare ground increases. Once this happens it will require increased energy input in terms of practice cost and management to bring back.

Production can vary from 250 to 1300 pounds of air dry vegetation per acre per year.

The following is an estimated growth curve of this plant community expected during a normal year. Vegetative growth begins earlier in the southern reaches (Baca, Bent, Kiowa, Las Animas and Prowers counties) of MLRA-67B. Vegetative growth will typically be suppressed during the months of June through August in these counties due to higher evapotranspiration rates.

Growth curve number: CO6711
Growth curve name: Warm season dominant, cool season sub-dominant, excess litter; MLRA-67B; upland coarse texture soil.

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	2	8	20	35	17	10	5	3	0	0

(monthly percentages of total annual growth)

Transitions or pathways leading to other plant communities are as follows:

- Long term non-use/rest (greater than 25 years) can move this plant community across an ecological threshold causing accelerated erosion *(Blowout).*
- Prescribed grazing that allows for adequate recovery periods following each grazing event, if applied soon enough, will move this plant community toward the *Sand Bluestem, Prairie Sandreed, Switchgrass, Western Sandcherry Plant Community (HCPC).* This transition can happen in a relatively short time frame.

Sandhill Muhly Plant Community

This plant community is established under historic continuous grazing. Sandhill muhly has increased to the point of being the dominant species. Red threeawn, blowout grass, Indian ricegrass and lemon scurfpea have also increased. Sand bluestem, Indiangrass, switchgrass, prairie sandreed, western sandcherry and leadplant have been removed.

Species diversity and overall production are reduced significantly. Litter levels are low. Bare ground has increased and blowouts are forming or enlarging. Carbon reserves have been severely depleted. Community dynamics, nutrient cycle, water cycle and energy flow has been severely impaired. Desertification is advanced.

Production varies from 150 to 700 pounds of air dry vegetation per acre per year and will average 400 pounds.

The following is an estimated growth curve of this plant community expected during a normal year. Vegetative growth begins earlier in the southern reaches (Baca, Bent, Kiowa, Las Animas and Prowers counties) of MLRA-67B. Vegetative growth will typically be suppressed during the months of June through August in these counties due to higher evapotranspiration rates.

Growth curve number: CO6710
Growth curve name: Warm season dominant; MLRA-67B; upland coarse textured soils.

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	0	5	20	40	20	10	5	0	0	0

(monthly percentages of total annual growth)

Transitions or pathways leading to other plant communities are as follows:

- Continuous grazing without adequate recovery periods following each grazing event will cause this plant community to cross an ecological threshold and form *Blowouts.* Severe erosion is a major concern.
- Long term prescribed grazing with adequate recovery periods following each grazing event will eventually move this plant community to the *Sand Bluestem, Prairie Sandreed, Switchgrass, Western Sandcherry Plant Community (HCPC)* or associated successional plant communities, assuming an adequate seed/vegetative source is available. This transition may take greater than 20 years depending on the size of the area, proximity to seed source and remnant species present.

Blowout

Long term continuous grazing and/or heavy stocking with continuous grazing, disturbance (tillage, vehicle traffic, etc.) and/or wildfires bring about this condition. This condition is not stable. It consists of bare areas that are continually eroded by wind. Blowouts will continue to increase in size if adequate recovery periods and reclamation efforts are not applied. Desertification is well advanced.

- Animal impact and prescribed grazing will begin to heal this plant community and move it toward the A*nnuals Plant Community.*

Annuals Plant Community

This early succession plant community can either be the result of continuous grazing applied to an early perennial plant community, or the result of controlled short term animal impact and prescribed grazing applied to a blowout. Production can vary greatly depending on the plant density and weather conditions in any year. Cheatgrass, Japanese brome, kochia, Russian thistle, sunflower, pigweed, sixweeks fescue and annual buckwheat are common. Wind erosion is a concern.

Production can vary from 0 to 200 pounds per acre of air-dry vegetation per year.

- Continuous grazing without adequate recovery opportunities will shift this plant community toward the *Blowout* condition.
- Prescribed grazing that allows adequate recovery periods between grazing events will move this plant community toward the *Early Perennials Plant Community.*

Early Perennials Plant Community

This plant community evolves with long term continuous grazing from a more advanced plant community or with prescribed grazing from the annuals plant community. Blowout grass, Indian ricegrass, sandhill muhly, needleandthread and lemon scurfpea are some of the first perennials to occupy this community. Wind erosion remains a concern.

Production can vary from 50 to 300 pounds per acre of air-dry vegetation per year.

- Continuous grazing without adequate recovery periods between grazing events will move this plant community toward the *Annuals Plant Community* and eventually to the *Blowout* condition.
- Long term prescribed grazing that allows adequate recovery periods following each grazing event will eventually move this plant community toward the *Sand Bluestem, Prairie Sandreed, Switchgrass, Western Sandcherry Plant Community (HCPC)* or associated successional plant communities, assuming an adequate seed/vegetative source is available.

Ecological Site Interpretations

Animal Community – Wildlife Interpretations

Sand Bluestem, Prairie Sandreed, Switchgrass, Western Sandcherry Plant Community (HCPC)
The structural diversity in the plant community found on the HCPC is attractive to a number of wildlife species. Common bird species expected on the HCPC include Cassin's and Brewer's sparrow, chestnut collared longspur, lark bunting, western meadowlark, and ferruginous and Swainson's hawks. The combination of mid-tall grasses and shrubs provides habitat for greater and lesser prairie chicken in the eastern parts of this site. Scaled quail may also use this community.

White-tailed and black-tailed jackrabbit, badger, pronghorn, coyote, swift fox, plains pocket gopher, long-tailed weasel, and several species of mice are mammals that commonly use this plant community. Reptiles using this community include western rattlesnake, bullsnake, plains garter snake western hognose snake, racer, western box turtle, and six-lined racerunner.

Increased Blue Grama, Hairy Grama, Small Soapweed, Decreased Tall Grasses and Shrubs Plant Community
All HCPC species are expected in this plant community, however, the loss of some of the vegetative structural diversity in this plant community make it less attractive to many HCPC species.

Low Plant Density, Excessive Litter; Sandhill Muhly; Blowout; Annuals; and Early Perennials Plant Communities
As these communities develop into a more open landscape the wildlife species will shift toward the typical shortgrass prairie species such as horned lark, killdeer, long-billed curlew, McCown's longspur, and ferruginous hawk. In addition, mountain plover, and burrowing owl might use these communities where slopes are less than 5%.

Other Potential Species
The plains spadefoot is the only common species of frog or toad inhabiting grasslands in Eastern Colorado. This species requires water for breeding. Tiger salamanders may be found on grassland sites, but require a water body for breeding. Either of these species may be found in any plant community if seasonal water requirements are met. Mule and white-tailed deer may use this ecological site for feeding, however the shrub cover is too low to provide escape or hiding cover. On ecological site locations near riparian areas, deer will use the vegetation for feeding. Big brown bats will use any plant community on this ecological site if a building site is in the area. The gray wolf, black-footed ferret, and wild bison used this ecological site in historic times. The wolf and ferret are thought to be extirpated from Eastern Colorado. Bison are currently found only as domestic livestock.

Animal Preferences (Quarterly – 1,2,3,4†)

Common Name	Cattle				Sheep				Horses				Deer				Antelope				Bison				Elk			
Grass and Grass-likes																												
blowout grass	U	U	D	U	N	N	N	N	U	U	D	U	N	N	N	N	N	N	N	N	U	U	D	U	U	U	D	U
blue grama	D	P	P	D	D	P	P	D	D	P	P	D	D	P	P	D	D	P	P	D	D	P	P	D	D	P	P	D
hairy grama	U	D	P	U	D	P	P	D	U	D	P	U	D	P	P	D	D	P	P	D	U	D	P	U	U	D	P	U
Indian ricegrass	D	P	D	D	D	P	D	D	D	P	D	D	D	P	D	D	D	P	D	D	D	P	D	D	D	P	D	D
Indiangrass	U	D	P	D	U	D	U	U	U	D	P	D	U	D	U	U	U	D	U	U	U	D	P	D	U	D	P	D
little bluestem	U	D	P	U	N	D	D	N	U	D	P	U	N	D	D	N	N	D	D	N	U	D	P	U	U	D	P	U
needleandthread	U	P	D	D	N	D	N	D	U	P	D	D	N	D	N	D	N	D	N	D	U	P	D	D	U	P	D	D
prairie junegrass	U	D	U	D	N	D	N	U	U	D	U	D	N	D	N	U	N	D	N	U	U	D	U	D	U	D	U	D
prairie sandreed	U	D	D	U	U	D	U	U	U	D	D	U	U	D	U	U	U	D	U	U	U	D	D	U	U	D	D	U
red threeawn	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
sand bluestem	U	D	P	D	U	D	U	U	U	D	P	D	U	D	U	U	U	D	U	U	U	D	P	D	U	D	P	D
sand dropseed	U	D	U	N	N	U	D	N	U	D	U	N	N	U	D	N	N	U	D	N	U	D	U	N	U	D	U	N
sand paspalum	N	U	U	N	N	U	N	N	N	U	U	N	N	U	N	N	N	U	N	N	N	U	U	N	N	U	U	N
sandhill muhly	N	U	N	N	N	N	N	N	N	U	N	N	N	N	N	N	N	N	N	N	N	U	N	N	N	U	N	N
sideoats grama	U	D	P	U	U	D	P	U	U	D	P	U	U	D	P	U	U	D	P	U	U	D	P	U	U	D	P	U
switchgrass	U	D	D	U	U	D	U	U	U	D	D	U	U	D	U	U	U	D	U	U	U	D	D	U	U	D	D	U
tall dropseed	N	U	N	N	N	U	N	N	N	U	N	N	N	U	N	N	N	U	N	N	N	U	N	N	N	U	N	N
needleleaf sedge	U	P	D	D	U	P	D	D	U	P	D	D	U	P	D	D	U	P	D	D	U	P	D	D	U	P	D	D
sun sedge	U	P	D	D	U	P	D	D	U	P	D	D	U	P	D	D	U	P	D	D	U	P	D	D	U	P	D	D
thinstem flatsedge	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Forbs																												
annual buckwheat	U	U	U	U	N	U	U	N	U	U	U	U	N	U	U	N	N	U	U	N	U	U	U	U	U	U	U	U
bigtop dalea	U	D	P	U	U	P	P	U	U	D	P	U	U	P	P	U	U	P	P	U	U	D	P	U	U	D	P	U
bush morningglory	U	D	P	U	U	D	D	U	U	D	P	U	U	D	D	U	U	D	D	U	U	D	P	U	U	D	P	U
Carolina gromwell	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
dotted gayfeather	U	U	D	U	U	D	P	U	U	U	D	U	U	D	P	U	U	D	P	U	U	U	D	U	U	U	D	U
groundplum milkvetch	U	D	U	U	U	D	D	U	U	D	U	U	U	D	D	U	U	D	D	U	U	D	U	U	U	D	U	U
hairy goldaster	U	U	D	U	N	N	N	N	U	U	D	U	N	N	N	N	N	N	N	N	U	U	D	U	U	U	D	U
heliotrope	U	U	U	U	N	N	N	N	U	U	U	U	N	N	N	N	N	N	N	N	U	U	U	U	U	U	U	U
ironplant goldenweed	U	D	D	U	U	P	P	U	U	D	D	U	U	P	P	U	U	P	P	U	U	D	D	U	U	D	D	U
lemon scurfpea	U	U	U	U	N	U	U	N	U	U	U	U	N	U	U	N	N	U	U	N	U	U	U	U	U	U	U	U
Missouri goldenrod	U	U	D	U	N	U	U	N	U	U	D	U	N	U	U	N	N	U	U	N	U	U	D	U	U	U	D	U
narrowleaf penstemon	U	D	U	U	U	P	P	U	U	D	U	U	U	P	P	U	U	P	P	U	U	D	U	U	U	D	U	U
nuttails evolvulus	U	U	D	U	U	D	D	U	U	U	D	U	U	D	D	U	U	D	D	U	U	U	D	U	U	U	D	U
pacific peavine	U	D	U	U	U	P	P	U	U	D	U	U	U	P	P	U	U	P	P	U	U	D	U	U	U	D	U	U
prairie spiderwort	U	U	U	U	N	N	N	N	U	U	U	U	N	N	N	N	N	N	N	N	U	U	U	U	U	U	U	U
purple prairie clover	U	P	P	D	U	P	P	U	U	P	P	D	U	P	P	U	U	P	P	U	U	P	P	D	U	P	P	D
silky prairie clover	U	D	P	U	U	P	P	U	U	D	P	U	U	P	P	U	U	P	P	U	U	D	P	U	U	D	P	U
snowball sand verbena	U	U	U	U	N	N	N	N	U	U	U	U	N	N	N	N	N	N	N	N	U	U	U	U	U	U	U	U
stickleaf mentzelia	U	U	U	U	N	N	N	N	U	U	U	U	N	N	N	N	N	N	N	N	U	U	U	U	U	U	U	U
stiff sunflower	U	D	P	U	U	D	P	U	U	D	P	U	U	D	P	U	U	D	P	U	U	D	P	U	U	D	P	U
upright prairie coneflower	U	U	D	U	U	P	P	U	U	U	D	U	U	P	P	U	U	P	P	U	U	U	D	U	U	U	D	U
veiny dock	U	U	U	U	N	U	U	N	U	U	U	U	N	U	U	N	N	U	U	N	U	U	U	U	U	U	U	U
western ragweed	U	D	U	U	U	D	U	U	U	D	U	U	U	D	U	U	U	D	U	U	U	D	U	U	U	D	U	U
whiteflower gilia	U	U	U	U	N	U	U	N	U	U	U	U	N	U	U	N	N	U	U	N	U	U	U	U	U	U	U	U
woolly Indianwheat	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
wormwood	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Shrubs																												
Arkansas rose	U	D	D	U	U	D	D	U	U	D	D	U	U	D	D	U	U	D	D	U	U	D	D	U	U	D	D	U
brittle cactus	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
leadplant	U	P	D	U	U	P	D	U	U	P	D	U	U	P	D	U	U	P	D	U	U	P	D	U	U	P	D	U
plains pricklypear	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
purple pincushion	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
sand sagebrush	U	N	N	U	U	N	N	U	U	N	N	U	U	N	N	U	U	N	N	U	U	N	N	U	U	N	N	U
skunkbrush sumac	D	U	U	D	D	U	U	D	D	U	U	D	D	U	U	D	D	U	U	D	D	U	U	D	D	U	U	D
small soapweed	D	P	N	D	D	P	N	D	D	P	N	D	D	P	N	D	D	P	N	D	D	P	N	D	D	P	N	D
spreading buckwheat	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
western sandcherry	D	P	P	D	D	U	U	D	D	P	P	D	D	U	U	D	D	U	U	D	D	P	P	D	D	P	P	D

N = not used; **U** = undesirable; **D** = desirable; **P** = preferred; **T** = toxic

† Quarters: 1 – Jan., Feb., Mar.; 2 – Apr., May, Jun.; 3 – Jul., Aug., Sep.; 4 – Oct., Nov., Dec.

Animal Community – Grazing Interpretations

The following table lists suggested initial stocking rates for cattle under continuous grazing (year long grazing or growing season long grazing) under normal growing conditions however, *continuous grazing is not recommended.* These are conservative estimates that should be used only as guidelines in the initial stages of the conservation planning process. Often, the current plant composition does not entirely match any particular plant community (described in this ecological site description). Because of this, a field visit is recommended, in all cases, to document plant composition and production. More precise carrying capacity estimates should eventually be calculated using the following stocking rate information along with animal preference data, particularly when grazers other than cattle are involved. Under more intensive grazing management, improved harvest efficiencies can result in an increased carrying capacity.

Plant Community	Production (lbs./acre)	Stocking Rate (AUM/acre)
Bluestem, Prairie Sandreed, Switchgrass, Western Sandcherry (HCPC)	1600	0.51
Increased Blue/Hairy Grama, Soapweed, Decreased Tall Grasses/Shrubs	700	0.22
Sandhill Muhly	400	0.13
Low Plant Density, Excessive Litter	*	*

Grazing by domestic livestock is one of the major income-producing industries in the area. Rangelands in this area provide yearlong forage under prescribed grazing for cattle, sheep, horses and other herbivores. During the dormant period, livestock may need supplementation based on reliable forage analysis.

* Highly variable; stocking rate needs to be determined on site.

Hydrology Functions

Water is the principal factor limiting forage production on this site. This site is dominated by soils in hydrologic group A. Infiltration and runoff potential for this site ranges from high to moderate. Water transmission through group A soils is normally greater than 0.30 inches per hour. Runoff is expected to occur only during the most intense storms (refer to NRCS Section 4, National Engineering Handbook (NEH-4) for runoff quantities and hydrologic curves).

Recreational Uses

This site provides hunting, hiking, photography, bird watching and other opportunities. The wide varieties of plants that bloom from spring until fall have an esthetic value that appeals to visitors.

Wood Products

No appreciable wood products are present on the site.

Other Products

None noted.

Supporting Information

Associated Sites

(067BY015CO) – Sands (formerly Deep Sands)
(067BY024CO) – Sandy (formerly Sandy Plains)

Similar Sites

(067BY015CO) – Sands (formerly Deep Sands)
[occurs on gentler slopes, more sand sagebrush prevalent]
(067BY031CO) – Sandy Bottomland
[occurs on gently sloping terraces adjacent to drainages]

Inventory Data References

Information presented here has been derived from NRCS clipping data, numerous ocular estimates and other inventory data. Field observations from experienced range trained personnel were used extensively to develop this ecological site description. Specific data information is contained in individual landowner/user case files and other files located in county NRCS field offices.

Those involved in developing this site include: Harvey Sprock, Rangeland Management Specialist, NRCS; Ben Berlinger, Rangeland Management Specialist; James Borchert, Soil Scientist, NRCS; Terri Skadeland, Biologist, NRCS.

State Correlation

This site is specific to Colorado.

Field Offices

Akron, Brighton, Burlington, Byers, Cheyenne Wells, Eads, Flagler, Fort Morgan, Greeley, Holly, Hugo, Kiowa (Castle Rock), Longmont, Simla, Springfield, Sterling

Other References

High Plains Regional Climate Center, University of Nebraska, 830728 Chase Hall, Lincoln, NE 68583-0728. (http://hpccsun.unl.edu)

USDA, NRCS. National Water and Climate Center, 101 SW Main, Suite 1600, Portland, OR 97204-3224. (http://wcc.nrcs.usda.gov)

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Site Description Approval

/s/ 03/25/2004

State Range Management Specialist Date